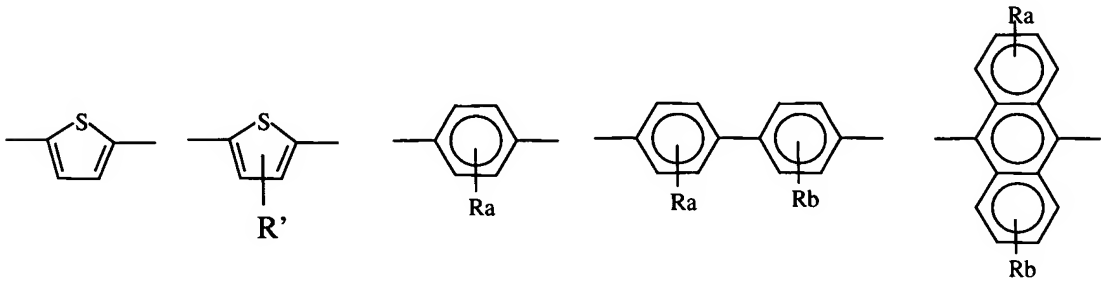
WHAT IS CLAIMED IS:

1. A thienylene-arylene polymer comprised of a repeating segment containing at least one 2,5-thienylene unit selected from (I) and (II), and from about one to about three arylene units selected from (IIIa), (IIIb), and/or (IIIc)



(I) (II) (IIIa) (IIIb) (IIIc)

wherein R is an alkyl or an alkoxy; R' is halogen, alkyl, or alkoxy, and a and b represent the number of Rs.

2. A polymer in accordance with **claim 1** wherein R is alkyl or alkoxy containing from about 1 to about 25 carbon atoms; R' is halogen, alkyl or alkoxy, each containing from about 1 to about 30 atoms, and wherein the number of 2,5-thienylene (I) and R'-substituted 2,5-thienylene units (II) in the repeating segment each independently represent a number of from 0 to about 10, provided at least one of said units is present.

3. A polymer in accordance with **claim 1** wherein a and b are independently selected from 1 and 2.

4. A polymer in accordance with **claim 1** wherein R is alkyl or alkoxy selected from the group consisting of pentyl, pentyloxy, hexyl, hexyloxy, heptyl, heptyloxy, octyl, octyloxy, nonyl, nonyloxy, decyl, decyloxy, undecyl, undecyloxy, dodecyl, dodecyloxy, tridecyl, tridecyloxy, tetradecyl, tetradecyloxy, pentadecyl, pentadecyloxy.

5. A polymer in accordance with **claim 1** wherein R' is alkyl or alkoxy selected from the group consisting of methyl, methoxy, ethyl, ethoxy, propyl, propoxy, butyl, butoxy, pentyl, pentyloxy, hexyl, hexyloxy, heptyl, heptyloxy, octyl, octyloxy, nonyl, nonyloxy, decyl, decyloxy, undecyl, undecyloxy, dodecyl, dodecyloxy, tridecyl, tridecyloxy, tetradecyl, tetradecyloxy, pentadecyl, and pentadecyloxy.

6. A polymer in accordance with **claim 1** wherein said arylene is a dialkylphenylene or dialkoxyphenylene.

7. A polymer in accordance with **claim 6** wherein dialkoxyphenylene is selected.

8. A polymer in accordance with **claim 7** wherein said dialkoxyphenylene is selected from the group consisting of bis(pentyloxy)phenylene, bis(hexyloxy)phenylene, bis(heptyloxy)phenylene, bis(nonyloxy)phenylene, bis(undecyloxy)phenylene, bis(dodecyloxy) phenylene, bis(tridecyloxy)phenylene, bis(tetradecyloxy)phenylene, and bis(pentadecyloxy)phenylene.

9. A polymer in accordance with **claim 6** wherein a dialkylphenylene is selected.

10. A polymer in accordance with **claim 9** wherein said dialkylphenylene is selected from the group consisting of dipentylphenylene, dihexylphenylene, diheptylphenylene, dioctylphenylene, dinonylphenylene, didecylphenylene, bis(undecyl)phenylene, bis(dodecyl)phenylene, bis(tridecyl)phenylene, bis(tetradecyl)phenylene, and bis(pentadecyl)phenylene.

11. A polymer in accordance with **claim 1** wherein R is alkyl or alkoxy containing from about 5 to about 25 carbon atoms, and R' is alkyl or alkoxy containing from 1 to about 25 carbon atoms

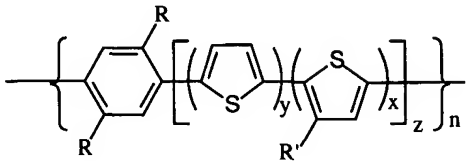
12. A polymer in accordance with **claim 1** wherein R' is halogen.

13. A polymer in accordance with **claim 1** wherein each of a and b is 1.

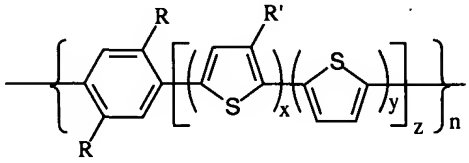
14. A polymer in accordance with **claim 1** wherein the arylene of the thienylene-arylene polymer is a dialkylphenylene.

15. A polymer in accordance with **claim 1** wherein the arylene is a dialkylphenylene or dialkoxyphenylene selected from the group consisting of dipentylphenylene, dihexylphenylene, diheptylphenylene, dioctylphenylene, dinonylphenylene, didecylphenylene, bis(undecyl)phenylene, bis(dodecyl)phenylene, bis(tridecyl)phenylene, bis(tetradecyl)phenylene, bis(pentadecyl)phenylene, bis(pentyloxy) phenylene, bis(hexyloxy)phenylene, bis(heptyloxy)phenylene, bis(octyloxy)phenylene, bis(nonyloxy)phenylene, bis(decyloxy) phenylene, bis(undecyloxy)phenylene, bis(dodecyloxy)phenylene, bis(tridecyloxy) phenylene, bis(tetradecyloxy)phenylene, and bis(pentadecyloxy)phenylene.

16. A polymer comprised of a thienylene-arylene polymer represented by Formula (IV-a) or (IV-b)



(IV-a)



(IV-b)

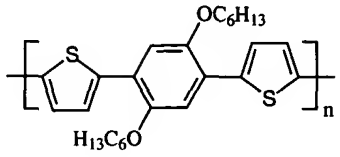
wherein R is an alkyl or alkoxy; R' is halogen, alkyl or alkoxy; x and y are independently selected from 0 to about 10, provided that the sum of x and y is equal to 1; z is about 1 to about 5, and n is the degree of polymerization, or the number of repeating segments in the thienylene-arylene polymer, and wherein the number of said repeating segments is from about 5 to about 500.

17. A polymer in accordance with **claim 16** wherein R is pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentyldecyl, pentyloxy, hexyloxy, heptyloxy, octyloxy, nonyloxy, decyloxy, undecyloxy, dodecyloxy, tridecyloxy, tetradecyloxy, or pentadecyloxy.

18. A polymer in accordance with **claim 16** wherein R′ is methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, tridecyl, tetradecyl, pentyldecyl, methoxy, ethoxy, propoxy, butoxy, pentyloxy, hexyloxy, heptyloxy, octyloxy, nonyloxy, decyloxy, undecyloxy, dodecyloxy, tridecyloxy, tetradecyloxy, or pentadecyloxy.

19. A polymer in accordance with **claim 16** wherein x, y and z are each independently a number of from about 1 to about 5.

20. A polymer in accordance with **claim 16** wherein said thienylene-arylene polymer (IV-a) or (IV-b) is selected from polymers (1) through (20)



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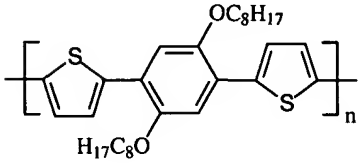

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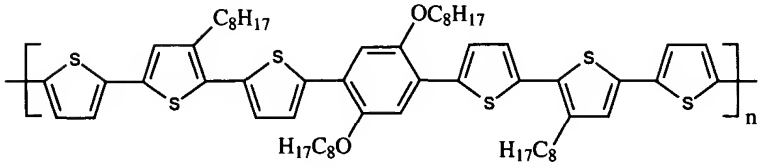

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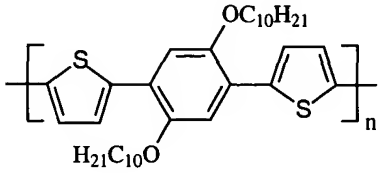

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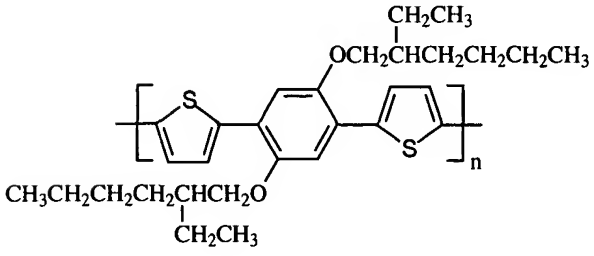

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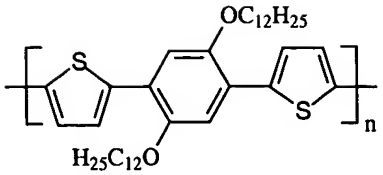
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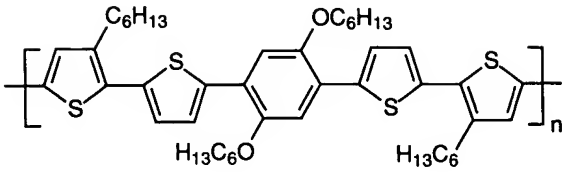
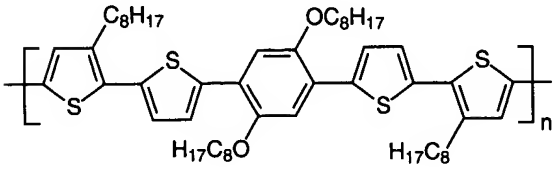
S
S
n
H25C12O

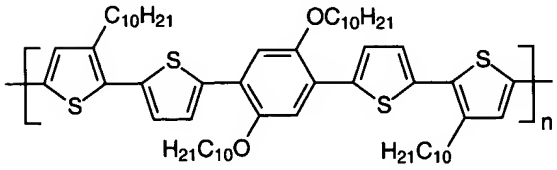
(6)


C6H13
OC6H13
S
S
S
S
n
H13C6O
H13C6

(7)


C8H17
OC8H17
S
S
S
S
n
H17C8O
H17C8

(8)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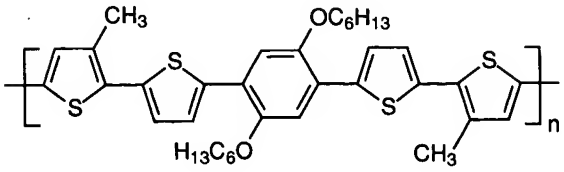
OC10H21
S
S
S
S
n
H21C10O
H21C10

(9)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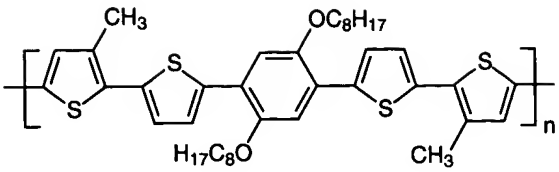
OC6H13
S
S
S
S
n
H13C6O
CH3

(10)



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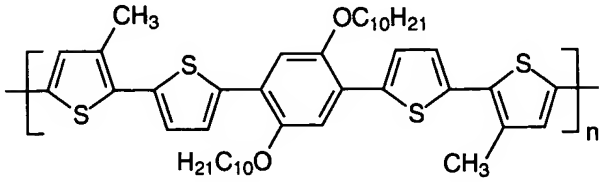

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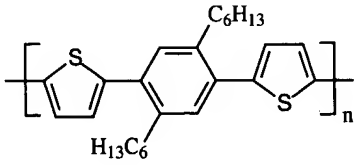

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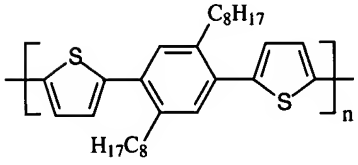

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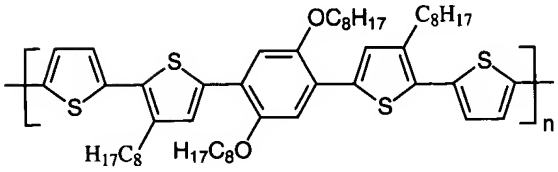

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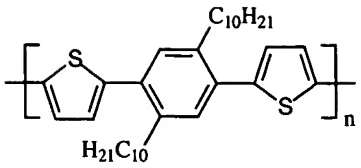

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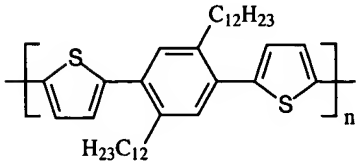

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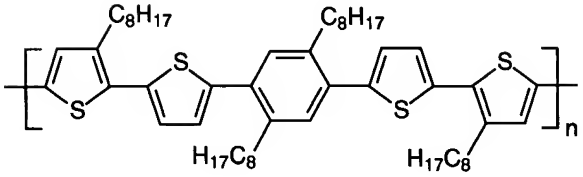

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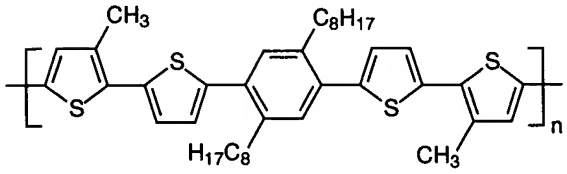

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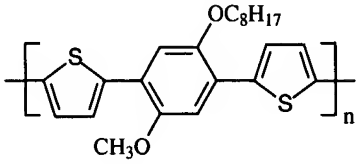
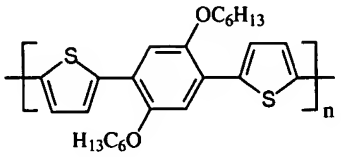


(20)

wherein n is the degree of polymerization, or the number of repeating segments in the thienylene-arylene polymer, which n is optionally a number of from about 5 to about 200.

21. A polymer in accordance with **claim 16** wherein said thienylene-arylene is selected from polymers (1) through (15)



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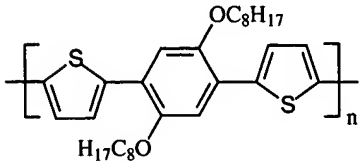

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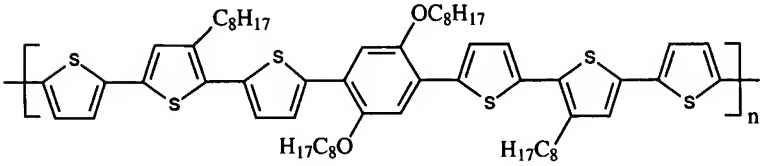

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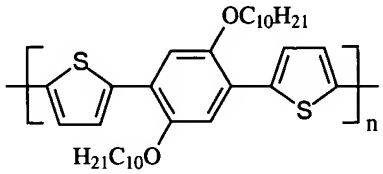

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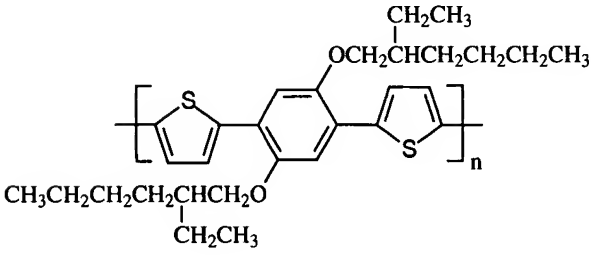

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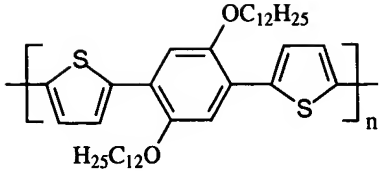

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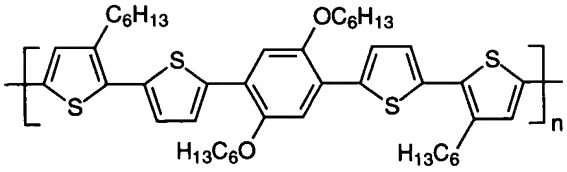

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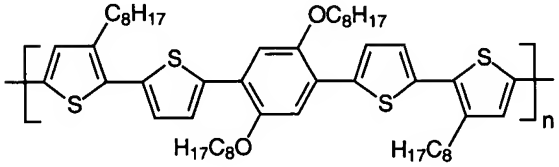

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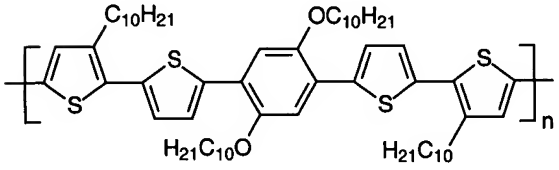

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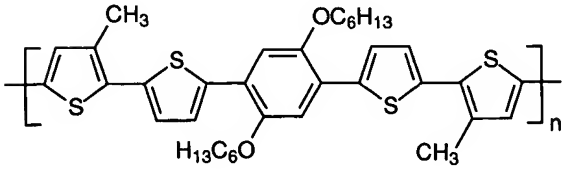

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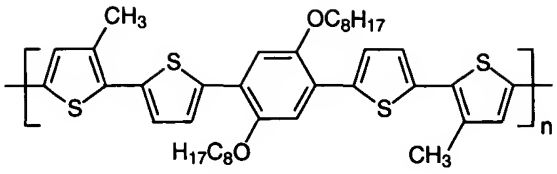

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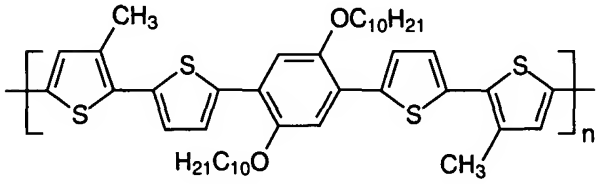

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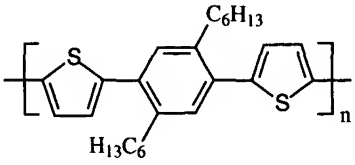

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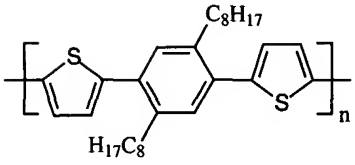

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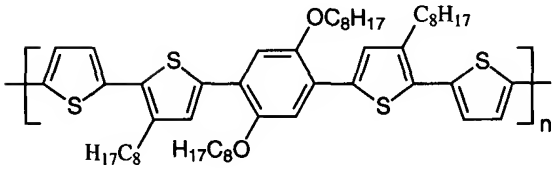
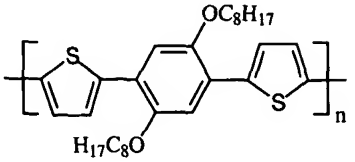


(15)

wherein n is a number of from about 5 to about 200.

22. A polymer in accordance with **claim 16** wherein said thienylene-arylene polymer is alternatively



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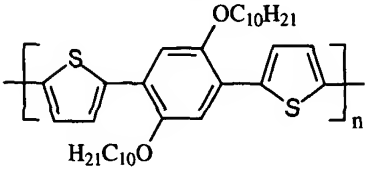

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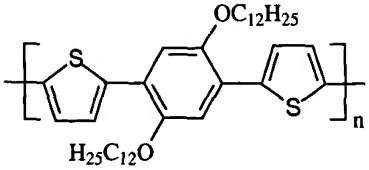

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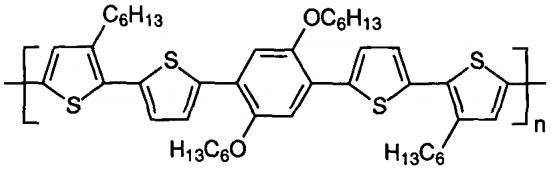

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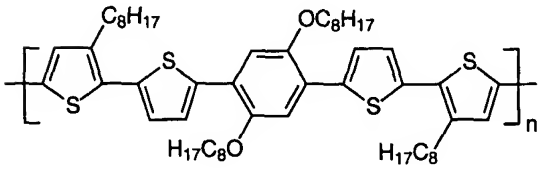

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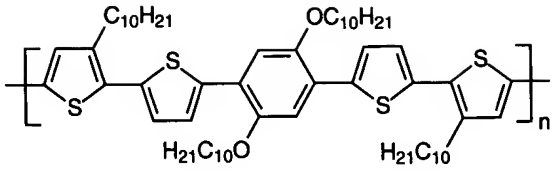
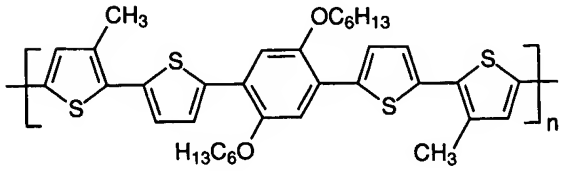
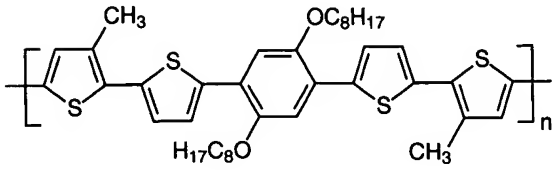

C10H21
OC10H21
S
S
S
S
H21C10O
H21C10
n

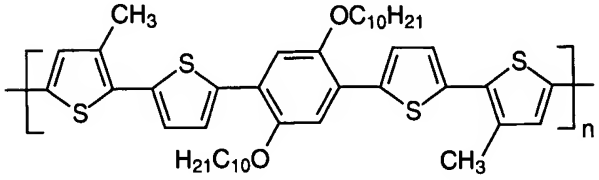
(9)


CH3
OC6H13
S
S
S
S
H13C6O
CH3
n

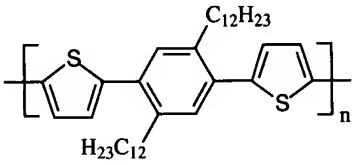
(10)


CH3
OC8H17
S
S
S
S
H17C8O
CH3
n

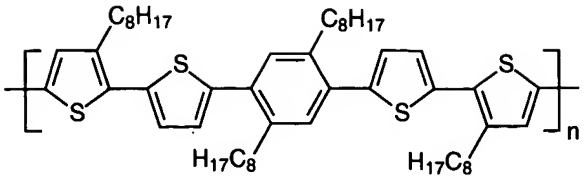
(11)


CH3
OC10H21
S
S
S
S
H21C10O
CH3
n

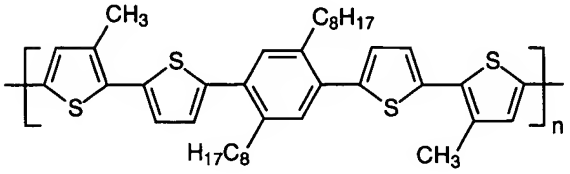
(12)


C12H23
S
S
H23C12
n

(17)



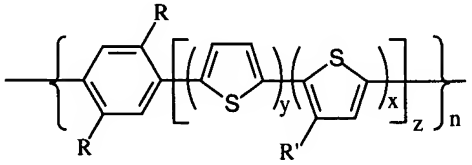
(18)



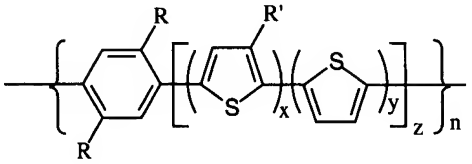
(19)

wherein n is a number of from about 5 to about 200.

23. A polymer represented by Formula (IV-a) or (IV-b)



(IV-a)



(IV-b)

wherein R is an alkyl or alkoxy with about 5 or more carbon atoms; R' is halogen, alkyl or alkoxy of 1 to about 30 carbon atoms; x and y are each independently from 0 to about 10, provided that the sum of x and y is equal to 1; z is about 1 to about 5, and n is the degree of polymerization, or the number of repeating segments.

24. A polymer in accordance with **claim 7** wherein said dialkoxyphenylene is bis(octyloxy)phenylene or bis(decyloxy)phenylene.